UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,044	12/06/2001	Hajime Matsumoto	43247	4952

1609 7590 08/04/2006

ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P.
1300 19TH STREET, N.W.
SUITE 600
WASHINGTON,, DC 20036

EXAMINER	
PUTTLITZ, KARL J	

ART UNIT	PAPER NUMBER
1621	

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/003,044	MATSUMOTO ET AL.	
	Examiner	Art Unit	
	Karl J. Puttlitz	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,6 and 8-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 8-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The rejection under section 103 is maintained and repeated below. Applicant's remarks in connection with this ground of rejection are also addressed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5, 6 and 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,709,928 to Murayama et al. (Murayama) in view of U.S. patent No. 4,317,962 to Sato et al. (Sato), in further view of *Kirk-Othmer Encyclopedia of Chemical Technology* (Kirk Othmer)

Murayama teaches the production of hydroxyalkylacrylates from the reaction alkylene oxides and acrylic or methacrylic acid. See column 1, lines 30-42.

The patent teaches a distillation of the reaction mixture to produce a distalate containing methacrylic acid (MAA in Table 1):

TABLE 1

	Additive at the time of distillation (20 g.)	Reaction yield (mol percent)	Distillation yield (wt. percent)	Composition of product: HEMA wt. percent	MAA wt. percent	EDMA wt. percent	Hue of product (APHA)	Material adhered to heating portion of distillation unit
Example 2	Triethyleneglycol	92.0	96.0	93	0.6	6.2	5	Not observed.
Comparative example: 1	Dioctylphthalate	97.0	95.0	98	0.6	0.8	1	Observed.
2	None	97.0	93.0	98	1.6	0.8	1	Do.

Murayama fails to explicitly teach the addition of polymerization inhibitors. It is for this purpose that the examiner joins Sato. Sato teaches that it is well known that acrylic acid polymerizes so readily that, its polymer tends to be formed in the apparatus, particularly in the respective distillation towers, frequently impeding the operations of the apparatus and thus leading to a lowering of yield of acrylic acid to be a product. To avoid this, there has been widely accepted heretofore, as a method of inhibiting the polymerization of acrylic acid, a method of adding polymerization inhibitors to the steps, particularly to the absorption and distillation towers. As a typical polymerization inhibitor there is well known hydroquinone, which is generally used in combination with other effective polymerization inhibitor such as molecular oxygen, phenols, e.g., phenol, cresol and tert-butyl catechol, amines, e.g., diphenylamine, phenothiazine and methylene blue, quinones, e.g., hydroquinone monomethylether, or inorganic and organic salts, e.g., copper dimethyldithiocarbamate, copper diethyldithiocarbamate, copper dibutyldithiocarbamate and copper salycilate. See column 1, lines 23-53. Accordingly, those of ordinary skill would have been motivated to add polymerization inhibitors any distillation where acrylic acid or MAA is present, and is therefore, prima facie obvious.

Applicant maintains that Murayama fails to teach the recycling of methacrylic acid. However, those of ordinary skill would be motivated to recycle raw materials isolated from a reaction product in order to increase reaction efficiency, and therefore, recycling methacrylic acid as a raw material is prima facie obvious. This is especially true for valuble reagent such as MAA or its derivatives, which are industrially important

chemicals, See Kirk Othmer. Therefore, notwithstanding the fact that neither Murayama nor Sato teach recycle of methacrylic acid, its recycle is well within the motivation of those of ordinary skill in order to recover a valuable reagent.

Again, Applicant argues that Murayama fails to teach the recycle of (meth)acrylic acid. This ignores the statement in the rejection that recycling of valuable materials like MAA is obvious in view of references which teach its value such as Kirk Othmer. In this regard, it is always within the motivation of those of ordinary skill to provide for the recycling of unreacted starting materials, which is longstanding in the chemical arts, whether or not a reference specifically states this axiom in the process of hydroxyalkyl (meth)acrylates. This argument is also applied to other materials such as alkaline oxide, see claims 2 and 3.

The examiner also maintains that plate or packed columns are strongly suggested by the term "distillation" as it applies to the separation of (meth)acvrylic acid. Morover, the recovery of any product, including hydroxyalkyl(meth)acrylates, is within the motivation of those of ordinary skill. With regard to s a second distillation step, it is well known that further purification of MAA is by further distillation.

The examiner submits that Sato is provided for the proposition that polymerization inhibitors are used in any purification system where MAA is present, notwithstanding the fact that the instant claims are drawn to the preparation of hydroxyalkyl(meth)acrylic acid. In this regard, those of ordinary skill would have been motivated to modify the process of Murayama to include the disclosed polymerization inhibitors.

With regard to the "intermediate tank" in claims 12 and 14, any conduit, such as a tube, would meet this limitation.

The objection to the Oath is withdrawn in view of the application data sheet provided in the outstanding reply by Applicant.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-

0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karl J. Puttlitz
Assistant Examiner

THURMAN K. PAGE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600
Thurman K. Page
Supervisory Patent Examiner
Art Unit 1621
Technology Center 1600

571-272-0602